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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,920	01/10/2006	Anthony Haynes	608-474	5439

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EXAMINER	
TAKEUCHI, YOSHITOSHI	
ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/563,920	HAYNES ET AL.	
	Examiner	Art Unit	
	YOSHITOSHI TAKEUCHI	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-44 and 46-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-44 and 46-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 25-44 and 46-50 are presented for examination, wherein claims 25, 30-31, 36-37, 39, and 41-42 are amended and claims 1-24 and 45 are cancelled.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 30, 2009 has been entered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 25-26, 43-44 and 46 are rejected under 35 U.S.C. 102(b) as anticipated by Muskett (US 6,255,527).

Regarding claims **25-26**, **43-44 and 46**, Muskett teaches a process for the production of acetic acid by reacting with carbon monoxide, methanol or a reactive derivative thereof in a liquid reaction composition comprising methyl acetate, a finite concentration of water, acetic acid (implied since the reaction produces acetic acid) and a catalyst system (abstract), which catalyst system comprises an Group VIII noble metal carbonylation catalyst (abstract and 4:21-

22, where iridium is a Group VIII metal), methyl iodide co-catalyst, and at least one non-hydrohalogenoic acid promoter (abstract) selected from an oxoacid, a superacid, a heteropolyacid and mixtures thereof (4:21-22, where the carboxylic acid is an oxoacid promoter) and optionally one or more of ruthenium, osmium, rhenium, zinc, gallium, tungsten, cadmium, and mercury (4:59-60, as promoters), and a methyl acetate concentration of less than about 6% w/w, which is within the instantly claimed range (2:7).

5. Claims 25-26, 43-44 and 46 are rejected under 35 U.S.C. 102(b) as anticipated by Watson et al (US 5,831,120).

6. Regarding claims **25-26**, **43-44 and 46**, Watson teaches a process for the production of acetic acid (abstract) by reacting with carbon monoxide, methanol or a reactive derivative thereof in a liquid reaction composition comprising methyl acetate, a finite concentration of water, acetic acid and a catalyst system (3:23-31), which catalyst system comprises an iridium carbonylation catalyst (6:29-30), methyl iodide co-catalyst (9:64), and propionic acid (6:47, where propionic acid is an oxoacid), and optionally one or more promoters selected from the group consisting of ruthenium, osmium, rhenium, mercury, zinc, gallium, and tungsten (9:63-66), and a methyl acetate concentration of up to 5 wt%, which is within the instantly claimed range (6:50-51).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 27-29 and 32-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over either [Muskett (US 6,255,527) or Watson et al (US 5,831,120)] in view of Vanderpool et al (US 4,629,809).

a. Regarding claims **27-29**, Muskett or Watson, teaches the method of claim 26, but does not teach the promoter being sulfuric acid.

Vanderpool teaches a method of preparing acetic acid by carbonylation of methanol in the presence of a ruthenium catalyst system (abstract) in the presence of a sulfuric acid promoter. (7:12-13, an oxoacid with an element in Group 16 of the Periodic Table).

Vanderpool teaches that both iridium and ruthenium can be used as catalysts in the methanol carbonylation to acetic acid (abstract and 1: 35-40). As a result, it would have been obvious to a person of ordinary skill at the time of the invention to form acetic acid using the method of Muskett or Watson, using sulfuric acid of Vanderpool as part of the catalyst system since Vanderpool teaches sulfuric acid promotes the carbonylation reaction of methanol to acetic acid (abstract, 7:12-13 and claim 1) in an iridium or ruthenium catalyst system (abstract and 1: 35-40), such as the Muskett or Watson system.

b. Regarding claim **30-31**, Muskett, and Watson, teaches the method of claim 27, and an inorganic acid, sulfuric acid can be used in the catalytic system (7:12-13), where the concentration of the catalyst can be from 0.05 to 20 wt% (7:61-62) and the concentration of sulfuric acid can be from 1 to 30 wt% (8:15-19). This range overlaps the instantly claimed ranges.

c. Regarding claims **32-35**, Muskett or Watson, teaches the method of claim 26, but does not teach the promoter being either sulfuric acid or trifluoromethanesulfonic acid.

Vanderpool teaches a method of preparing acetic acid by carbonylation of methanol in the presence of a ruthenium catalyst system (abstract) in the presence of trifluoromethanesulfonic acid (claim 1, a super acid).

Vanderpool teaches that both iridium and ruthenium can be used as catalysts in the methanol carbonylation to acetic acid (abstract and 1: 35-40). As a result, it would have been obvious to a person of ordinary skill at the time of the invention to form acetic acid using the method of Muskett or Watson, using trifluoromethanesulfonic acid of Vanderpool as part of the catalyst system since Vanderpool teaches

trifluoromethanesulfonic acid promotes the carbonylation reaction of methanol to acetic acid (abstract, 7:12-13 and claim 1) in an iridium or ruthenium catalyst system (abstract and 1: 35-40), such as the Muskett or Watson system.

d. Regarding claim **36-37**, Muskett in view of Vanderpool or Watson in view of Vanderpool, teaches the method of claim 32, wherein Vanderpool teaches the use of trifluoromethanesulfonic acid (7:28-30) as a promoter, but does not teach the ratio of the two to use.

However, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456 (CCPA 1955). In this case, Vanderpool does not specify the workable ranges for the ratio of catalyst to trifluoromethanesulfonic acid promoter, but it does describe the general conditions of the claim, namely using trifluoromethanesulfonic acid in the catalyst system. It would not be inventive to discover the workable ranges by routine experimentation of the invention taught by Vanderpool.

11. Claims 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over either [Muskett (US 6,255,527) or Watson et al (US 5,831,120)] in view of Tokumoto et al (US 5,166,419).

a. Regarding claims **38-40**, Muskett in view of Vanderpool, and alternatively Watson in view of Vanderpool, teaches the method of 26, but does not teach the promoter is a heteropolyacid.

Tokumoto teaches an iridium carbonylation catalyst system with methyl iodide (7:32-34, 9:23 and 10:31-33) using phosphoric acid (5: 33-34) and also heteropolyacids, such as molybdophosphoric acid (which suggests 12-molybdophosphoric acid) and tungstosilicic acid as a carbonylation promoter (which suggests 12-tungstosilicic acid) (5:39-40).

As a result, it would have been obvious to a person of ordinary skill at the time of the invention to use the heteropolyacids molybdophosphoric acid or tungstosilicic acid of Tokumoto in the carbonylation catalyst system of either Muskett or alternatively Watson in order to form acetic acid, since Tokumoto teaches such heteropolyacids promote an iridium catalyzed carbonylation reaction.

b. Regarding claims **38-40**, Muskett in view of Vanderpool or Watson in view of Vanderpool, teaches the method of 26, but does not teach the ratio of iridium to heteropolyacid promoter.

Tokumoto teaches an iridium carbonylation catalyst system (7:32-34, 9:23) using phosphoric acid (5: 33-34) and heteropolyacid (5:39-40)., but does not expressly teach the exact ratio. However, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456 (CCPA 1955). In this case, Tokumo does not specify the workable ranges for the ratio of catalyst to heteropolyacid acid promoter, but it does describe the general conditions of the claim, namely using heteropolyacid acid in the catalyst system. It would not be inventive to discover the workable ranges by routine experimentation of the invention taught by Tokumoto.

12. Claims 27-29 and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over either [Muskett (US 6,255,527) or Watson et al (US 5,831,120)] in view of Vanderpool et al (US 4,629,809) and further in view of in view of Tokumoto et al (US 5,166,419).

a. Regarding claims **38-40**, Muskett in view of Vanderpool, and alternatively Watson in view of Vanderpool, teaches the method of 26, but does not teach the promoter is a heteropolyacid.

Tokumoto teaches an iridium carbonylation catalyst system with methyl iodide (7:32-34, 9:23 and 10:31-33) using phosphoric acid (5: 33-34) and also heteropolyacids, such as molybdophosphoric acid (which suggests 12-molybdophosphoric acid) and tungstosilicic acid to promote a carbonylation reaction (which suggests 12-tungstosilicic acid) (5:39-40).

As a result, it would have been obvious to a person of ordinary skill at the time of the invention to use the heteropolyacids of Tokumoto in the carbonylation catalyst system of either [Muskett or Watson] in view of Vanderpool since Tokumoto teaches that heteropolyacids molybdophosphoric acid are tungstosilicic acid are equivalently useable as phosphoric acid in promoting an iridium catalyzed carbonylation reaction.

b. Regarding claims **38-40**, Muskett in view of Vanderpool or Watson in view of Vanderpool, teaches the method of 26, but does not teach the ratio of iridium to heteropolyacid promoter.

Tokumoto teaches an iridium carbonylation catalyst system (7:32-34, 9:23) using phosphoric acid (5: 33-34) and heteropolyacid (5:39-40)., but does not expressly teach the exact ratio. However, "where the general conditions of a claim are disclosed in the

prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456 (CCPA 1955). In this case, Tokumoto does not specify the workable ranges for the ratio of catalyst to heteropolyacid acid promoter, but it does describe the general conditions of the claim, namely using heteropolyacid acid in the catalyst system. It would not be inventive to discover the workable ranges by routine experimentation of the invention taught by Tokumoto.

Response to Arguments

13. Applicant's arguments with respect to claims 25-44 and 46-50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOSHITOSHI TAKEUCHI whose telephone number is (571) 270-5828. The examiner can normally be reached on Monday-Thursday 9:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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